

Postgraduate Medical School,  
Ducane Road,  
London, W.12.  
28 July, 1952.

Dear Lederberg,

I have just returned from holiday in Dublin (my home town). I intended writing to you to answer your letter of June 24 before I went away but found I had too much to do. I have already sent you a copy of my paper to the JGM(not air mail). In this I have stuck to my views on the transfer of genetic material (one-way) from the F+ to the F- strain and on the identity of F+ and Gene carrier. I have put up the best case I can for these conceptions while admitting that the latter, at least, is largely speculative. If I have mis-quoted you in any way in this paper, let me know and I will alter it. I have this morning received Cavalli's & your paper, the title of which is very similar to that of my own, and have forwarded it to the editor of the JGM. With regard to my letter of June 20 & your reply of the 24th.:

1. Effect of UV on F+ X F+ crosses. You suggest that UV may have two effects so that some cells are phenotypically upgraded & others attenuated in their F+ character. This may be so but, if it is the case, the upgrading must greatly predominate to account for the considerable UV enhancement of fertility of F+ in F+ X F- crosses. Thus my argument concerning the effect of UV, in F+ X F+ crosses, on recombination rate & the phenotype of prototrophs when either one, or both, of the F+ parents are irradiated, still stands. I think that one of the most important points to clear up is this question of whether F+ cells are really capable of mating.

2. Filterability of F+ agent. In my last letter I told you that I appeared to have obtained a few F+ colonies by growing W-677/F- in a collodion filtrate of 58-161/F+. On checking these colonies by my standard technique I failed to obtain any prototrophs with 58-161/F-. Unfortunately I did not think to check on the prototroph colonies originally produced on "screening" against 58/F- but if it is assumed that they were genuine then the results suggest that a few F+ agents did pass the filter but were unstable in the W-677 cells. I wonder if your wife has had similar experiences with filtration.

You ask if I have demonstrated the UV effect on W-677/F+: the answer is "Yes". I have also demonstrated it with 58/F- converted to F+. I was interested to read in the latest C., L. & L. paper that prototrophs from an Hfr X F- cross are F-. I have had no experience with Hfr but find its behaviour very intriguing. I have not yet managed to think of any mechanism whereby it could be fitted into my theory! I gathered that these prototrophs, however, were also Hfr. If so, are they unstable too and revert to NfrF+? I shall be interested to hear the results of your projected work with whatever of your new recombining strains you select, and whether or not chromosomal "eliminations" are a normal feature of Coli recombinations.

Best of luck,

Yours sincerely,

*Bill Hayes*